

# 操作手册 Operating Manual

换向阀 Diverter valves

适用型号：标准系列 DK,DT,DV

Applicable model: Standard series DK, DT, DV

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**1 概述****1 Summary**

本操作手册是该产品的组成部分，包含操作和维修等重要说明，便于设备或系统维护人员学习整个设备的使用及安装过程。

This operating manual is an integral part of the product and contains important instructions such as operation and maintenance, which can make it easier for equipment or system maintenance personnel to learn how to use and install the equipment.

本手册包含一些重要的安全及维护信息，它能够指导操作人员正确的、安全的、更经济的使用该产品设备。使用之前认真阅读该手册，可以有效避免设备损伤，降低维护成本，减少停车时间，最大程度的延长设备的使用寿命。

This manual contains some important safety and maintenance information, which can guide operators to use the product and equipment correctly, safely and economically. A careful read of the manual before use can effectively avoid equipment damage, reduce maintenance costs and shutdown time, and maximize the service life of the equipment.

建议将该手册放在设备附近位置。

It is recommended to put the manual near the equipment.

操作手册字迹清晰并且易于理解。确保设备和设备运行负责人及设备操作人员已仔细阅读并理解本操作手册。若对指南内容存在疑问或欲了解更多信息,请联系科狮公司。

The operation manual is legible and easy to understand. Ensure that the person in charge of equipment and equipment operation and equipment operators have carefully read and understood all of it. If you have any questions about the contents of the guide or want more information, please contact us.

设备部分信息需结合产品样本查询。 (手册中已经指出)

Some information of the equipment needs to be queried in combination with product samples. (This has been pointed out in the manual).

由于不遵守本手册警告的不当操作以及对于其他鉴定为非正常操作引起的伤害和事故，损失及相关维护费将由用户自己承担。

Users themselves shall bear the losses and related maintenance costs due to improper operations that do not comply with the warnings in this manual and other injuries and accidents identified as abnormal operations.

## 2 初次使用

### 2 First use

- 换向阀主要用于：

The diverter valve is exclusively for  
切换物料流向 Change flow direction  
连续输送 Continuous conveting  
风送系统 Wind delivery system

- 换向阀按照相关的标准和技术水平设计和制造，但不正当的操作仍然会给人身造成伤害甚至伤残或死亡。不正当的使用也可能不利于关联设备的正常运作。

The reversing valve is designed and manufactured according to the relevant standards and technical level, but the improper operation can still cause personal injury or even disability or death. Improper use may also be detrimental to the normal operation of the associated equipment.

- 所有机械工作只可由经过培训的专业人员执行。本操作手册中所涉及的专业人员是指熟悉安装位置、机械安装、产品的故障排除与维护并具备以下资质的人员：

All mechanical work can only be performed by a trained professional. Professionals involved in this operation manual refer to the personnel familiar with the installation location, mechanical installation, troubleshooting and maintenance of the products, and have the following qualifications:

- 接受过机械专业的培训（如机械工程师或机电工程师）并通过结业考试  
Received mechanical professional training (such as mechanical engineer or mechanical engineer) and passed the completion examination.
- 了解本操作手册  
Understand this operating manual
- 换向阀不适合用于输送不稳定化学品及高等级易爆物品。  
The diverter valves are not suitable for transporting unstable chemicals and high-grade explosive items.
- 换向阀启动时须保证腔体内没有堆满物料。尤其是颗粒物料。

The reversing valve shall ensure that the cavity is not filled with material. Especially the particulate matter material

- 使用该设备，除手册规定外，还应按照国家规定的其它相关安全和环保条例正确操作。配件（如电磁阀、气缸等）的相关使用规定请参照配件的操作手册。

Besides the manual, the equipment shall be operated correctly in accordance with other relevant safety and environmental protection regulations stipulated by the state. Refer to the operating manual for accessories (such as solenoid valves, cylinders, etc.).

- 建议在标定的设计压力下正确使用该设备。

Correct use this machine at calibrated design pressure.

- 只要设备的电气配件得到正确的防护，换向阀允许在室内或室外使用。

Changing valves are allowed to be used indoors or outdoors as long as the electrical fittings of the equipment are properly protected

- 若未明确设计，则禁止在存在爆炸隐患的区域内使用。

The diverter valve is prohibited to use in the area of explosion if it is not clearly marked.

- 对于与设备配合的多种防爆配件组合使用的情况，允许的危险使用环境取较低的防爆等级。

For the combination of various explosion-proof accessories combined with the equipment, the allowable dangerous use environment takes a lower explosion-proof level.

- 换向阀专业用于重力流或气力输送切换物料流向用，不要期望用它来实现对输送管道保压。对于需要保压的场合，联系科狮公司。

Transfer valve is specially used for gravity flow or pneumatic transmission to switch the material flow direction, do not expect to use it to maintain the pressure on the conveying pipeline. For occasions that need pressure, contact TECLION company.



### 3 安全须知

#### 3 Safety instruction

##### 3.1 警告图标及其含义

###### 3.1 Warning icons and their meanings

本手册内的安全提示组成如下：

The safety tips in this manual are composed as follows:



有用的提示或技巧。

Useful hints and skills.



危险！直接面临或可能出现的危险情况。

Hazardous! Dangerous situations directly facing or may arise.



机械危险！可能造成伤残甚至死亡。

Mechanical hazards! May cause disability or even death.



爆炸危险！

Explosion hazard!

##### 3.2 管理措施

###### 3.2 Management Measures

- 本使用手册需置于设备附近。

This user manual should be located near the equipment.

- 除本手册外，使用及维护者仍需遵守公司、国家相关的安全和环保等规章制度，防止意外的发生。

In addition to this manual, users and maintenance shall still

comply with the company and national safety and environmental regulations to prevent accidents.

- 涉及本设备的所有机械工作，须经过手册培训方可。  
All mechanical work involving this equipment shall be subject to manual training.

- 使用组织可以参考本手册，对安全条例做适当的增补。  
Use organizations may refer to this manual for appropriate additions to safety regulations.

- 使用或维护本设备时，不允许将杂物（如绳索、塑料袋、零件等）置于阀门内，同时不允许长发、衣服松散者、佩戴首饰者操作，都有可能引起意外。

When using or maintaining the equipment, sundries (such as ropes, plastic bags, parts, etc.) are not allowed to be placed in the valve, and long hair, loose clothes, and jewelry wearer are not allowed to operate, which may cause accidents.

- 重视所有的安全警示。  
Value all safety warnings.
- 阀门发生意外，应立即停机并上报相关人员，防止由阀门引起系统安全问题。

If valve accident, shut down immediately and report to relevant personnel to prevent system safety problems caused by the valve.

- 未经科狮公司授权，不得对阀门设备的附件、机体进行更改。否则将引起不可预知的危险。

Do not make any changes, attachments or conversions to the machine, which could impair safety, without the authorization of the supplier.

- 设备零件更换，其规格型号需经制造商技术确认。  
Replacement parts must comply with the technical requirements set down by the manufacturer.
- 塑料件（如软管）需定期更换，即便未有可见瑕疵。

Plastic parts (such as hoses) need to be replaced regularly, even if there are no visible defects.

- 依据操作手册，定期对设备进行复检。

Re-inspect the equipment regularly according to the operation manual.

- 用户维护车间，需配齐维修用的相关设备和工具。

User maintenance workshop shall be equipped with relevant equipment and tools for maintenance.

- 注意防火。Watch out for fire!。

### 3.3 目标群体及要求

#### 3.3 Target Groups and Requirements

- 设备操作和维护者，必须是经过授权的达到法定年龄的健康人员。

Equipment operation and maintainer must be authorized healthy personnel reaching the legal age.

- 设备操作和维护者，必须是通过培训和明确职责的人员。

Equipment operation and maintainer must be personnel through training and clear responsibilities.

- 本设备涉及的电气部分，只可由经过培训的了解本操作手册的专业电气人员执行。

The electrical part of the equipment can only be performed by professional electrical personnel trained to understand this operation manual.

- 其他工作如运输、仓储、运行和废弃处理等必须有受过相应培训的人员进行。

Other work such as transportation, storage, operation and waste disposal must be carried out by corresponding trained personnel.

- 本设备涉及的压力管道的安装和维护，需受过培训的人员进行。

Installation and maintenance of pressure pipes involved in this equipment shall be conducted by trained personnel.

### 3.4 安装和开车阶段

#### 3.4 Installation and start-up stage

- 设备安装前，需检查与其对接的管道或其他设备内部已经被清理、清洗干净。

Before installation of equipment, the pipe or other equipment connected with it have been cleaned and cleaned.

- 勿将杂物留在系统内。

Do not leave the debris in the system.

- 若系统大修或阀门维修、管道更换，应重复上述清理步骤。

If the system overhaul or valve repair, pipe replacement, the above cleaning steps should be repeated.

- 应确保阀门安装后，无装配应力。（拉力、压力、扭力）

Valves shall be installed without assembly stress.(Tension, pressure, torsion).

- 设备投入运行前，建议试车一段时间。

It is recommended to test run briefly before the equipment is put into operation.

### 3.5 分类的危险警告

#### 3.5 Classified hazard warning

##### 3.5.1 电

##### 3.5.1 Electricity

- 电气维护人员需经过专业的培训并取得资格。

Electrical maintenance personnel must be professionally trained and qualified.

- 设备维护时应确保电磁阀电源和气源已被切断，且相关联的系统可能引起意外的电气设备也应该被切断。（如输送风机等）

The equipment shall be maintained to ensure that the solenoid valve power and gas source are cut off and that the electrical equipment where the associated system may be unexpected.( conveyor fan, etc.)

- 设备的电气部分必须定期检查，损坏的接线盒、接线端子、密封接头应该及时更换，且应确保电缆接点牢靠。

The electrical part of the equipment must be checked regularly. The damaged terminal boxes, wiring terminals and sealing joints should be replaced in time, and ensure that the cable contact is secure.

- 若由于生产需求，例行检查时不得断电停车的，应该安排一个能够及时切断设备电源的人员应急。

Due to the production demand, if no power shutdown can be cut off during the routine inspection, a personnel who can timely cut off the power supply of the equipment should be arranged for emergency response.

### 3.5.2 危险气体、粉尘、蒸汽

#### 3.5.2 Dangerous gas, Dust and Steam



- 虽然设备已经设计了密封系统，但仍然不能保证使用过程中气体零泄漏，对于危险环境，经常检查泄漏情况也是避免危险发生的有效方法。

Although the equipment has been designed to seal the system, it still cannot guarantee zero gas leakage during the use process. For the dangerous environment, often checking the leakage situation is also an effective way to avoid the danger.

- 焊接、切割、打磨设备时，应确保环境内和设备内部不含有爆炸性介质，且此类工作一定要得到相关部门的授权，方可操作。

When welding, cutting and grinding the equipment, we should ensure that the environment and inside the equipment contain no explosive media, and such work must be authorized by the relevant departments before operation.

- 对于使用氮气输送的介质，设备投入运行前需检查是否有氮气外漏。

When nitrogen is used to convey the materials, make sure there is no leakage around the valves.

#### 3.5.3 噪音

##### 3.5.3 Noise

- 标配的设备正常使用过程中噪音主要来自于气缸动作排气，已配有消音器，噪音一般不大。

Standard equipment in the normal use process of the process noise mainly comes from the cylinder action exhaust, has been equipped with a silencer, the noise is generally not large.

- 电驱动的设备，噪音主要来自于驱动电机。

Electric-driven equipment, the noise mainly comes from the drive motor .

#### 3.5.4 其他

##### 3.5.4 Others

- 处理油脂或其它化学物质时应该遵循相关的安全和环保条例。

When handling oils, fats and other chemical substances, pay attention to the safety regulations in application for the product!

- 伴热设备运行时，表面温度可能会达到危险的水平，所以维护人员需格外小心被烫伤，必要时需做隔热处理。

When the heat tracing equipment is running, the surface temperature may reach dangerous levels, so the maintenance personnel should be extra careful to be scalded, and should do heat insulation treatment if necessary.

### 3.6 可能引起险情的潜在危险源

#### 3.6 Potential hazard sources that may cause dangerous situations

- 拆解设备接线盒，需断电操作。

Power off operation is required if equipment junction box needs to be disassembled.

- 出现金属刮擦或金属异物导致阀芯转动不畅，需及时排除。

The metal scraping or metal foreign body leads to the poor rotation of the valve core, which needs to be eliminated in time.

## 4 运输和仓储

### 4 Transportation and storage

#### 4.1 包装

##### 4.1 Packaging

除合同另有约定，按照 GB/T13384-2008 《机电产品包装通用技术条件》

货物交付时应该检查其包装是否完整，内部设备是否完好。

返厂维修设备时，也应该按照上述标准打包。

Unless otherwise agreed in the contract, it should accord with

GB/T13384-2008 <general technical conditions of mechanical and

electrical products packaging>

When machines are delivered, they should be checked whether the packing is complete and whether the internal equipment is in good condition.

Return to manufacture maintenance equipment, it should also be packaged in accordance with the above standards.



#### 注意 NOTE

必须按照预定的支点来支撑设备，若设备未标明支撑点，应该固定设备法兰。

The equipment must be supported according to the predetermined fulcrum, and if the equipment has no support point, the equipment flange shall be fixed.

## 4.2 拆包

### 4.2 Packet disassembly

拆包无法避免人为和环境因素的影响，一般需要设备监管人员指导，避免拆包过程中对设备配件造成损伤。

注意包装箱上的提示符号。

The package can not avoid the impact of human and environmental factors, it need equipment supervision and guidance, to avoid damage to the equipment parts in the process of dismantling.

Notice the sign on the packing box.

## 4.3 仓储

### 4.3 Storage

储存设备，请按照下述条件执行：

Store the equipment according to the following conditions:

- 防潮、防尘。

Moisture-proof and dust-proof.

- 室内存放，温度控制在+5~+40°C。

Indoor storage, temperature controlled at + 5~ + 40°C.

- 远离腐蚀液、油、油漆、热辐射。

Stay away from corrosion fluid, oil, paint, thermal radiation.

- 由于设备配有气控元件等，还应参照配件规定的仓储条件。

Because the equipment is equipped with gas control components, it should also refer to the storage conditions stipulated by the accessories.

- 应保证设备气控元件进气口被防尘封堵。

The air inlet of the equipment shall be sealed with dust prevention.

- 若非封闭式存放，请将设备置于木质垫板上，必要时需有支撑。

If not closed, place the equipment on wooden pads with support if necessary.



## 注意 NOTE

禁止将设备置于过软、过窄的底座上，防止放置时发生倾倒。必要时需对设备多点支撑，保证其安放稳固。

The valve is forbidden to be placed on the base of soft, too narrow to prevent the dumping. When necessary, the equipment needs to support more points, to ensure that it is firmly placed.

#### 4.4 供货范围

##### 4.4 Scope of supply

除另有约定，随机有装箱清单，请核对物品完整。

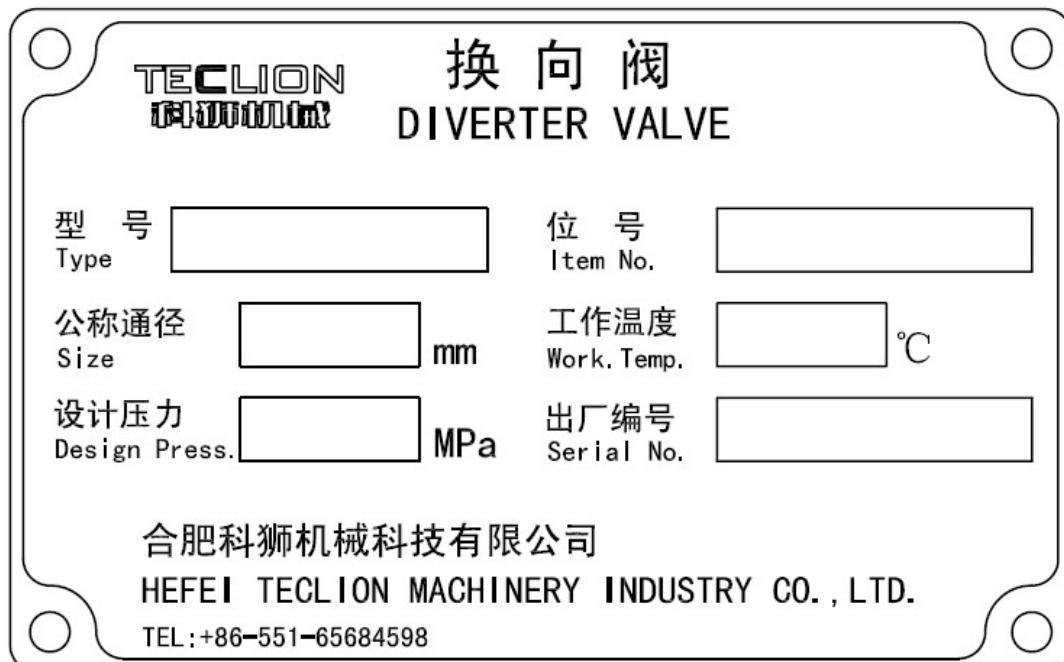
Unless otherwise agreed, random packing list, please check the integrity.

## 5 技术资料

### 5 Technical information

#### 5.1 铭牌

#### 5.1 Nameplate



设备出厂时，铭牌已按设备情况填写相关内容，并固定于设备体上，为保证设备情况的可追溯性，请勿移走。若使用过程中有脱落，请用户自行固定。

When the equipment leaves the factory, the nameplate has been filled in the relevant contents according to the equipment situation, and it has been fixed on the equipment body. To ensure the traceability of the equipment condition, please do not remove it. If it falls off during use, please fix it by yourself.

#### 5.2 型号说明

#### 5.2 Demonstration of the type



提示 NOTE

有关型号描述的详细情况以及其他信息可以参考产品样本或咨询科狮公司。 You can make inquiries of TECLION about Details of the model description, other information.

序号	1	2	3	4	5	6	7	8	9	10
型号 Model	D	B	K	150	H	R	—	P	—	S

序号 Model	描述 Depscriptin	字母分类 Alphabetical classification
1	产品大类 Product category	D 换向阀 Diverter valves
2	阀芯类型 Core type	空白: 旋转板式 B: 全通径球式 Blank: rotary plate type B: Full-path ball type
3	分向角度 Didirectional Angle	K: 45° T: 90° V: 60°
4	换向阀公称通径 DN inside nominal diameter	50-500
5	换向阀法兰等级 flange grade	空白: PN10 H: PN20 Blank: PN10 H: PN20
6	换向阀法兰形式 Flange form	空白: 平面法兰 R: 凸面法兰 Blank: flat flange R: raised-face flange
7	间隔 space	—
8	驱动形式区分 Drive form differentiation	空白: 手动 P: 气缸驱动 D: 电动 Blank: manual P: Cylinder drive D: motor-driven
9	间隔 space	—
10	换向阀材质 material quality	1、 奥氏体不锈钢 austenitic stainless steel S:304SS SL:304L SS:316 SSL:316L ST:321 SST:310S 2、 碳钢 C:WCB

### 5.3 设备应用范围

#### 5.3 Scope of equipment application

● 标准系列 DK,DT,DV Diverter valves: DK,DT,DV

适用于粉末或颗粒物料，重力流或气力输送稀相输送或密相输送末端。

Suitable for powder or granular materials, Gravity flow or pneumatic conveying dilute or dense phase conveying terminal.

● 球式系列 DB Diverter valves Ball

适用于粉末或颗粒物料，气力输送密相输送。

Suitable for powder or granular materials, Pneumatic conveying dense phase conveying.



#### 提示 NOTE

优先选用 45°夹角的换向阀。

The 45° angle-filled reversing valve is preferred.

### 5.4 设备允许使用工况

#### 5.4 Allowable working conditions

换向阀类型 type	标准系列 DK,DT,DV	球式系列 DB
允许使用压力 MPa Pressure allowed for use MPa	0.1-0.3	0.6
允许使用温度 °C Allowed temperature for use °C	标准配置的阀门: -30~120 Standard configuration valves: -30~120	



#### 注意 NOTE

阀门允许使用压力及使用温度，应严格按照铭牌标称。

The allowable service pressure and service temperature of the valve shall be strictly according to the nameplate nominal.



#### 提示 NOTE

超过标称工况使用，请咨询科狮公司。

For non-standard conditions, please consult TECLION Company.

## 5.5 噪音 Noise

在正常情况下，阀门不带载运转时的声音远低于驱动运转时产生的噪音。带料时的噪音主要来自物料与接触部位的金属摩擦产生的声音。正常的操作，噪音均低于 75db。

Under normal circumstances, the sound of the valve running without load is much lower than the noise generated during the drive operation. The noise when taking the material mainly comes from the sound caused by the metal friction between the material and the contact site. Normal operation, the noise is below 75db.

### 注意 NOTE



用户需对非正常的噪音提高警惕，如金属刮擦时产生的尖锐噪音，以及设备动作时剧烈震动等。必要时需及时停车处理。

Users should be alert to abnormal noise, such as sharp noise generated during metal scraping, and violent vibration during equipment action. Timely parking and treatment when necessary.

## 5.6 漏气和耗气情况

### 5.6 Air leakage and gas consumption situation

#### 5.6.1 漏气

##### 5.6.1 Air leakage

标准系列 DK,DT,DV,在设计给定的压力和温度条件下使用，均可以保证气力输送正常运行。

Standard series DK, DT, DV, used under the design given pressure and temperature conditions, can ensure the normal operation of pneumatic transmission.

球式系列 DB，密封效果更好，非常适用于密相输送场合。

Ball series DB, the sealing effect is better, very suitable for dense phase conveying occasions.

#### 5.6.2 耗气

##### 5.6.2 Air consumption

耗气来自于驱动气缸。部分统计如下表：

Gas consumption comes from the driving cylinder. Some statistics are shown in the table below:

阀门口径 Valve caliber	50	65	80	100	125	150	200	250	300
Gas consumption 耗气量	0.47	0.73	0.73	0.95	0.95	2.5	3.7	3.7	5.9
标准系列 D L/stroke standard series D L/stroke	0.95	0.95	0.95	1.6	2.5	3.7	5.9	7.5	11
球式系列 DB L/stroke Ball series DB L/stroke	0.95	0.95	0.95	1.6	2.5	3.7	5.9	7.5	11

## 5.7 设备材质

### 5.7 Equipment materials

请参考 5.2 型号说明序号 10。

Refer to 5.2 Model Description No.10.

## 5.8 设备重量

### 5.8 Equipment weight

请参考产品样本。

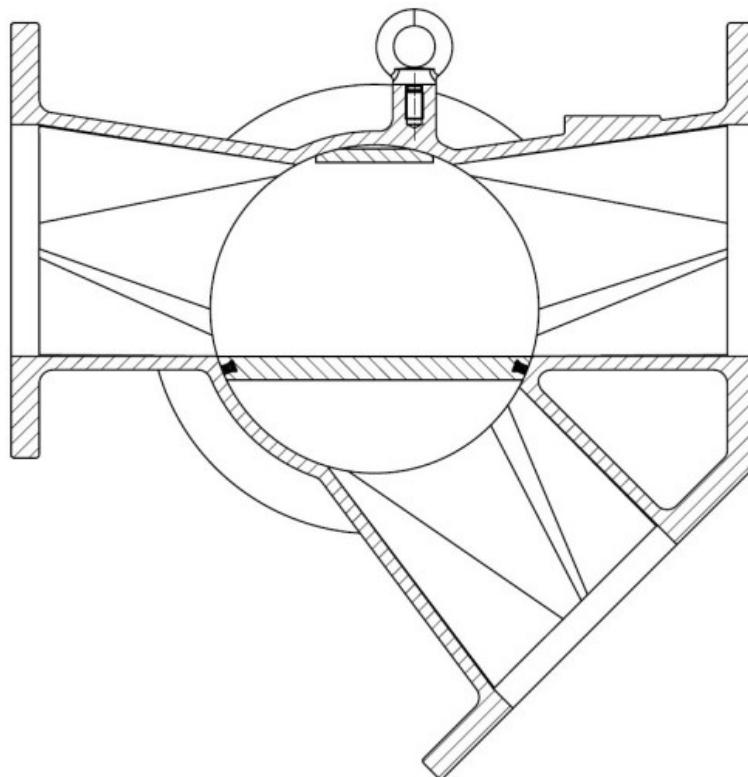
Please refer to the product sample.

## 5.9 换向阀基本构造

### 5.9 Basic structure

在阀体内腔，阀芯按一定角度摆动，即可实现三通，一进二出或二进一出。摆动速度可增设节流阀（非标配）调节，一般出厂换向一次速度<8s。

In the chamber of the valve body, the valve core according to a certain Angle, can realize three, one in two out or two in out. Swing speed can be added throttle valve (not standard) adjustment, the general factory change to the primary speed is <8s.



5.9.1 三通示意图

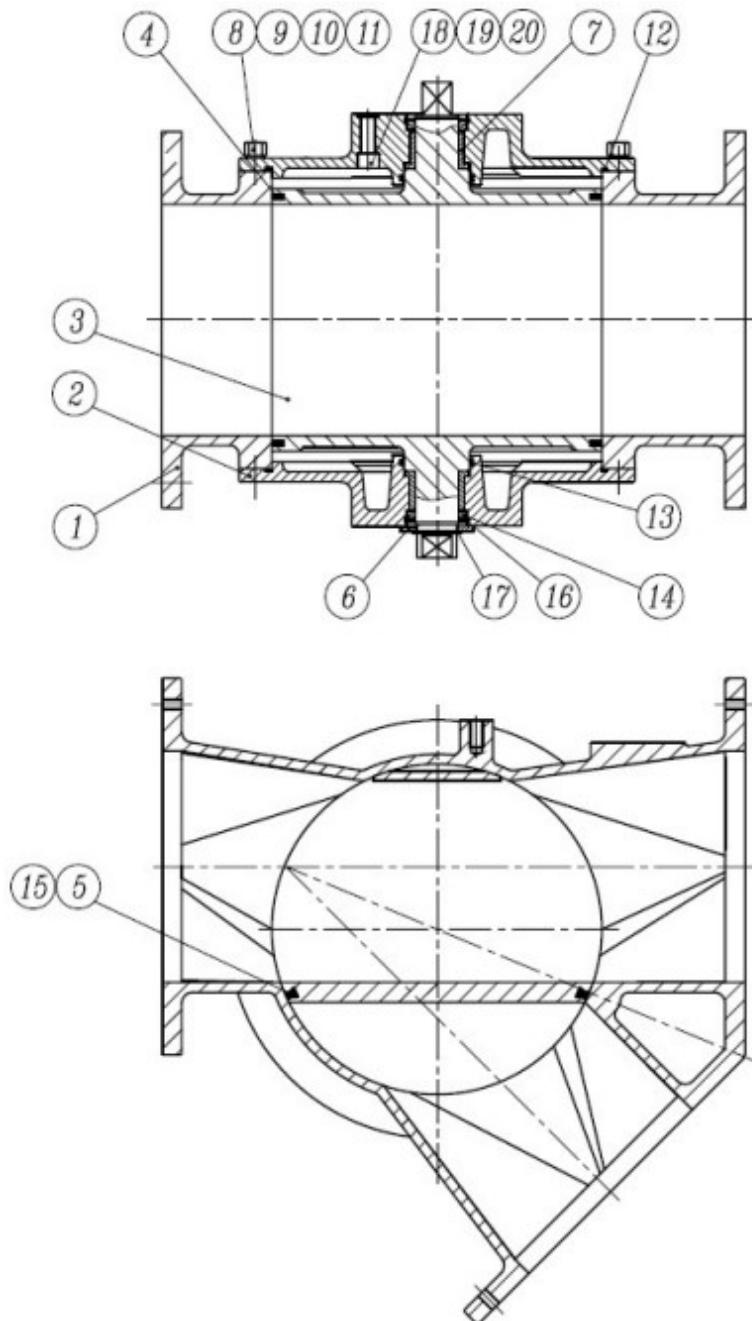
5.9.1 Three schematic diagram

## 5.10 装配图

### 5.10 Assembly drawin

#### 5.10.1 标准系列 DK,DT,DV

##### 5.10.1 Standard series DK,DT,DV



5.10.1 标准系列 DK 剖面图

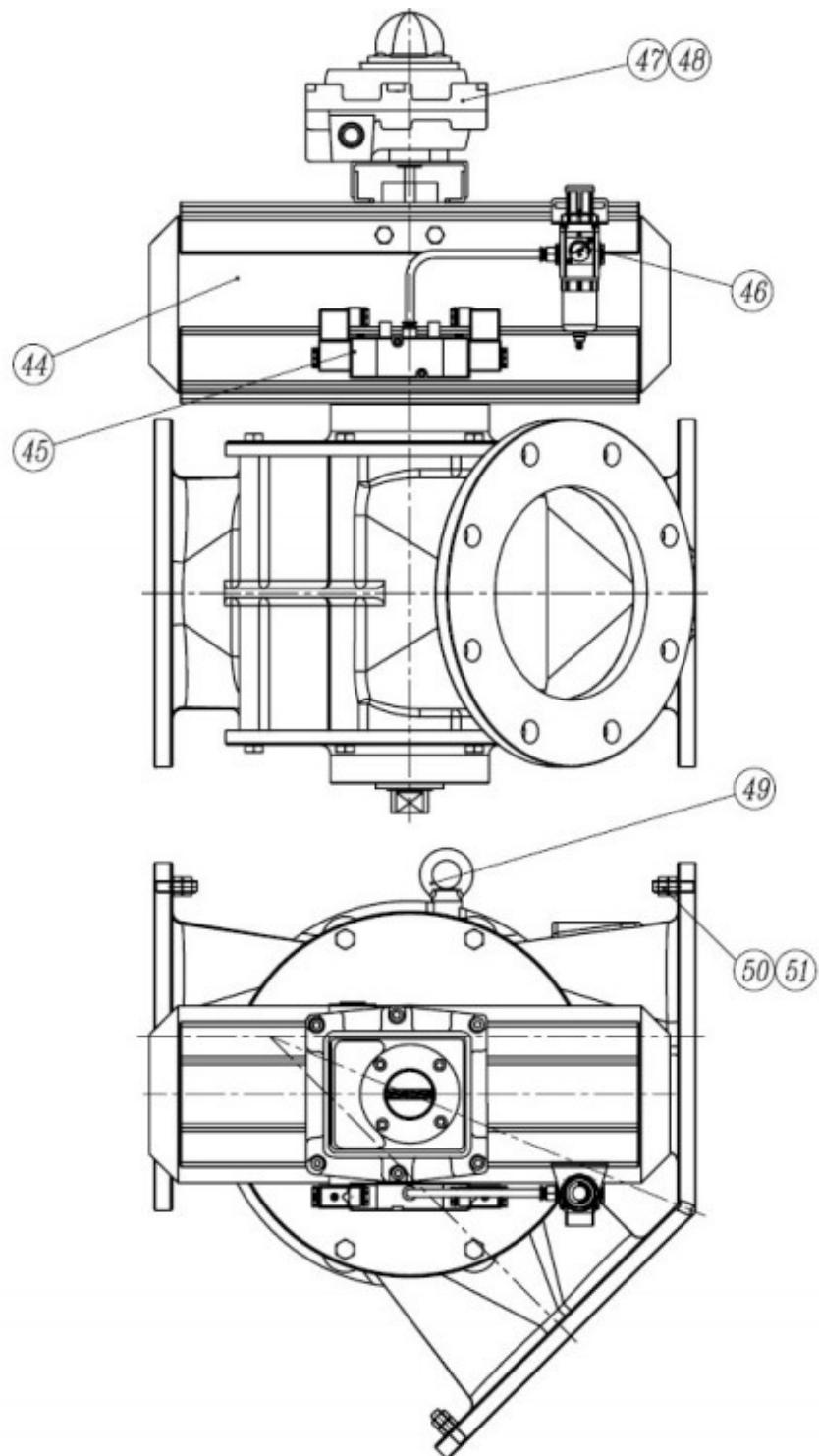
5.10.1 Standard series of DK profiles

5.10.2 带驱动装配图

5.10.2 Drive assembly diagram

5.10.2.1 标准系列 DK 气动

5.10.2.1 Standard series DK pneumatic





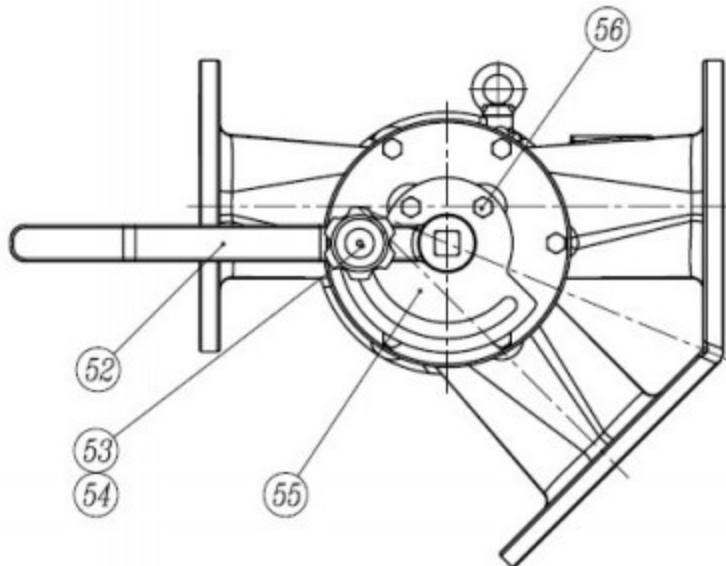
## 提示 NOTE

气缸、电磁阀和过滤减压阀的位置朝向以实物为准。

The orientation of the cylinder, solenoid valve and filter relief valve is physical.

## 5.10.2.2 其他驱动形式

## 5.10.2.2 Other driving forms



## 提示 NOTE

另有电动，蜗轮箱驱动，仅驱动形式不同，主要的阀门本体相同，维修和使用仍可参照本手册。

Another electric, worm wheel box drive, only the drive form is different, the main valve body is the same, maintenance and use can still refer to this manual.

## 5.10.3 明细表 Detail List

1	阀体 Body	30	弹簧垫圈 GB/T93
2	阀盖 valve deck	31	螺柱 GB/T897
3	阀芯 Valve core	32	弹簧垫圈 GB/T93
4	密封圈 Sealing ring	33	螺柱 GB/T897 Studs
5	密封条 Seal	34	螺母 GB/T6170 Nuts
6	垫圈 Gaskets	35	O型圈 GB/T3452.1 O ring
7	轴承 Shaft	36	O型圈 GB/T3452.1 O ring
8	螺栓 GB/T5783 Bolt	37	O型圈 GB/T3452.1 O ring
9	弹簧垫圈 GB/T93	38	O型圈 GB/T3452.1 O ring
10	螺柱 GB/T897 Studs	39	弹性圈 Elastic ring
11	螺母 GB/T6170 Nuts	40	螺钉 GB/T70.1 Screw
12	O型圈 GB/T3452.1 O ring	41	弹簧垫圈 GB/T93
13	O型圈 GB/T3452.1 O ring		Spring Washer
14	唇封 GB/T13871 Lip seal	42	O型圈 GB/T3452.1 O ring
15	O型圈 GB/T3452.1 O ring	43	螺塞 Screw plug
16	孔用弹性挡圈 GB/T893.1	44	气缸 Cylinder
17	轴用弹性挡圈 GB/T894.1	45	电磁阀 Solinoid valve
18	螺钉 GB/T70.1 Screw	46	过滤调压阀 Filter regulator
19	弹簧垫圈 GB/T93	47	接线盒 Junction box
20	O型圈 GB/T3452.1 O ring	48	限位开关 insided limit switch
21	短接 Short connection	49	吊环螺钉 Ring Screw
22	阀体 Body	50	螺钉 GB/T77 Screw
23	球体 Ball Body	51	螺母 GB/T6170 Nut
24	阀盖 Inspection cover	52	手柄 Handle
25	阀座 Valve seat	53	手轮 Handwheel
26	密封圈 Sealing ring	54	螺栓 GB/T5783 Bolt
27	垫片 Gaskets	55	定位盘 Locating Plate
28	轴承 Shaft	56	螺栓 GB/T5783 Bolt
29	螺栓 GB/T5783 Bolt		



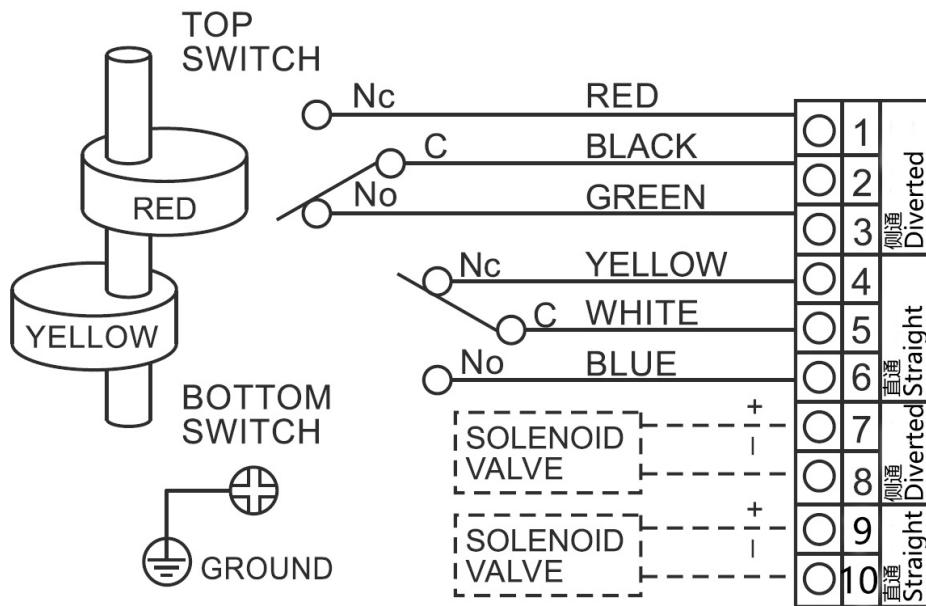
注意 NOTE

阴影标识属于易损件，可做备品备件，有损坏时需及时更换，以防意外发生。

Shadow logo belongs to vulnerable parts, can be spare parts, damage should be replaced in time to prevent accidents.

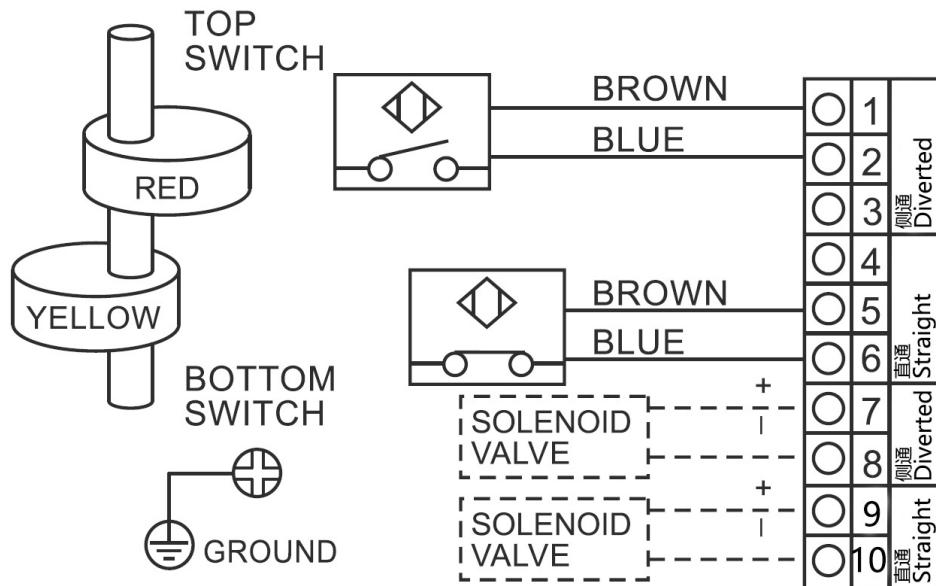
## 5.10.4 接线端子图

## 5.10.4 Terminal diagram of wiring



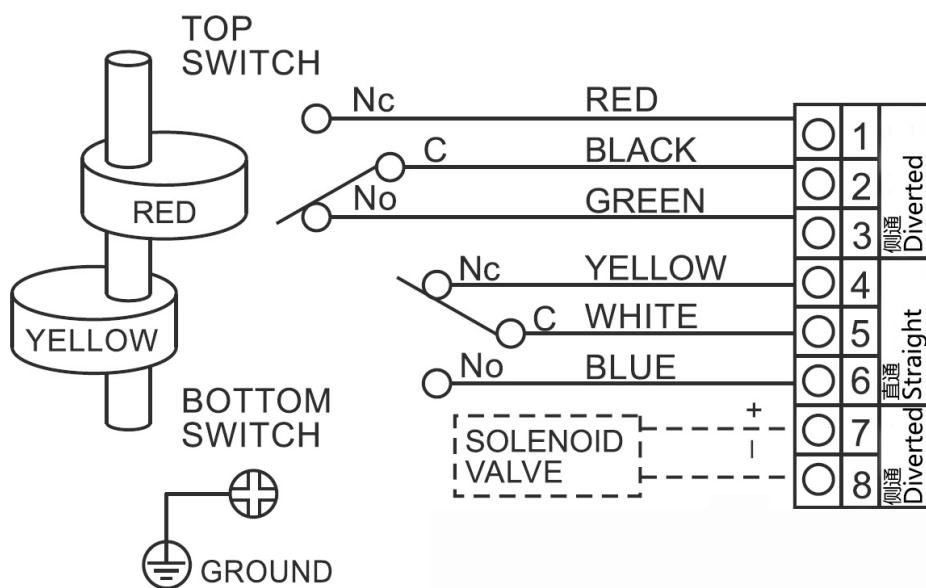
## 5.10.4.1 SPDT 开关双电控接线图

## 5.10.4.1 SPDT switch dual-electric control wiring diagram



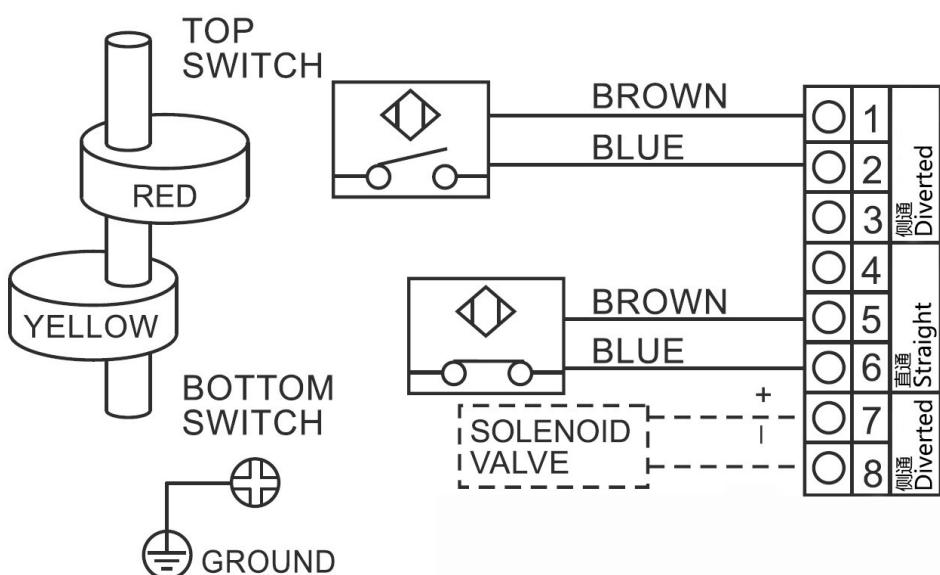
## 5.10.4.2 电感开关双电控接线图

## 5.10.4.2 Dual-electric control wiring diagram of inductor switch



5.10.4.3 SPDT 开关单电控接线图

5.10.4.3 SPDT Switch single-electric control wiring diagram



5.10.4.4 电感开关单电控接线图

5.10.4.4 Single-electric control wiring diagram of inductor switch



提示 NOTE

断电后方可打开接线盒。

Open the junction box only after power failure.



提示 NOTE

SPDT 开关位置信号提取相应通道的常开触点。

The SPDT switch position signal extracts the normally open contacts of the corresponding channel.

## 5.11 结构说明

## 5.11 Structure Specification

## 5.11.1 一般说明

## 5.11.1 General Description

- 经过专业设计的阀体 1，通过三个法兰分别接于输送管道，可以牢靠的支撑整个阀门。

The professionally designed valve body 1, through three flanges respectively connected to the conveying pipe, can firmly support the whole valve.

- 阀芯 3 通过轴承 7 支撑，球体 23 通过轴承 28 支撑。

Spool 3 is supported by bearing 7, and sphere 23 is supported by bearing 28.

- 标准系列换向阀 DK,DT,DV，阀芯 3 上装有密封密封圈 4 和密封条 5，用来形成密封，保证气力输送的正常运转，阻止物料泄露。

Standard series reversing valves DK, DT, DV, valve core ③ are equipped with sealing sealing ring ④ and sealing strip ⑤, used to form a seal, ensure the normal operation of pneumatic transmission, and prevent material leakage.

- 球式系列换向阀 DB, 球体 23 与短接 21 之间, 设计有弹性密封件组合 26 密封圈和 39 弹性圈，用于密封和补偿。

Ball series reversing valve DB, sphere 23 With short connection Between 21, the design of the elastic seal group Close 26 Seal ring and 39 Elastic ring, used for sealing and compensation.

- 轴承 7，轴承 28 均采用固体镶嵌自润滑，使用过程无需润滑。

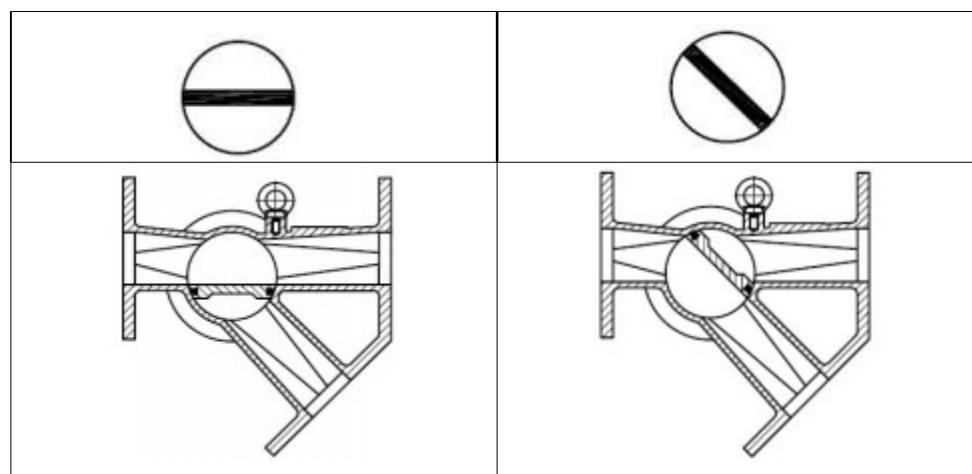
Bearing7.Bearing28 All use solid inlay self-lubrication, the use process without lubrication.

## 5.11.2 换向阀通道位置指示

## 5.11.2 Diverter Valve Channel Position Indication

接线盒 47 带有通道位置指示, 如下表:

connecting box 47 With channel position indication, as below:

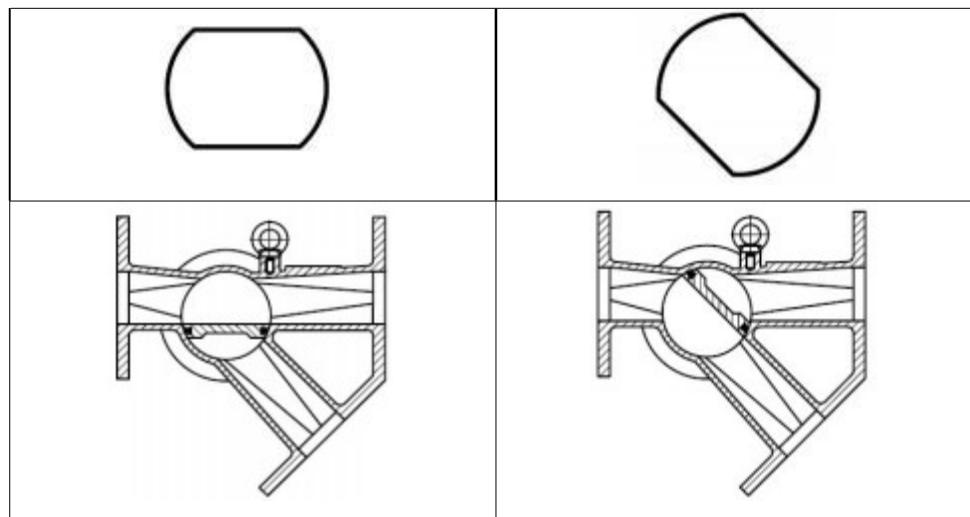


- 换向阀其它部位也有附加的指示作用, 说明如下:

Additional indication of the other parts of the reversing valve is also provided as follows:

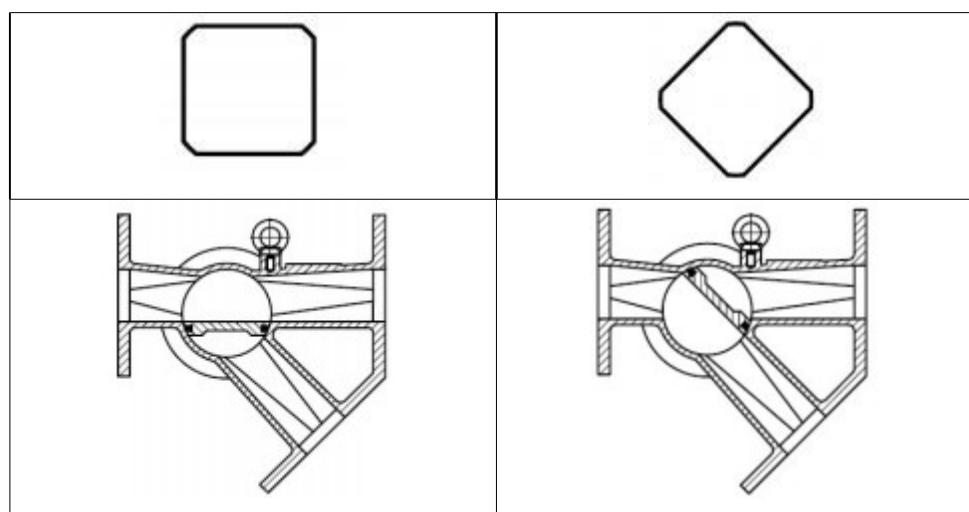
标准系列 DK,DT,DV, 非驱动端 6 垫片部位的扁头:

Standard Series DK, DT, DV, non-drive end 6. Flat head of the gasket part:



驱动端气缸与接线盒连接部位方头:

Square head of the connection part of the drive terminal cylinder and the terminal box:





## 提示 NOTE

60 度和 90 度换向阀，通过上述几个部位也能很快判断通道位置。

若仍有疑问，可联系科狮公司。

The 60 degree and 90 degree reversing valves can also quickly determine the channel position through the above several parts.

If you still have questions, please contact TECLION



## 提示 NOTE

其它部位附加指示仅适用于右向安装时（从气缸位置看去两个出料口在右手边）参考。

Additional indications for other parts shall apply only for the right-side installation (with two outlets on the right-hand side from the cylinder position) reference.

## 6 分解和装配

### 6 Decomposition and assembly

#### 6.1 换向阀安装于管道

##### 6.1 Install to the pipeline

###### 6.1.1 所需工具/辅助材料

###### 6.1.1 Required tools / auxiliary materials

1. 扳手套件 Wrench set

2. 起重设备 Lifting equipment

3. 紧固件、密封垫 (若需要请联系科狮公司)

Fastener, gasket (contact TECLION if need)

4. 上述工具非供货范围

All accessories do not belong to scope of supply.

###### 6.1.2 安装的先决条件

###### 6.1.2 Prerequisites for assembling

###### 注意 NOTE



不正当安装可能造成换向阀损伤。

仔细阅读本章节中的说明

Wrong installation may damage the valve ,gear box,motor. Read carefully the instructions of this section.

###### 危险 Danger



换向阀属于较重物品，安装时需要辅助支撑，防止挤压、坠空。

The reversing valve is a heavy item, which needs auxiliary support during installation to prevent extrusion and emptying.

###### 注意 NOTE



起吊或搬抬设备时，不得将施力点置于连接薄弱部位 (如接线盒支架) 。

When lift the equipment,you must not put the force point to the valve's weakposition,such as Actuator bracket etc.

检查下列各点要求是否得到满足：

Check that the following points are met:

- 换向阀在运输或者仓储过程中未遭受损坏。 (必要时可通气试动作)

The reversing valve is not damaged during transportation or storage.(Ventilation test action if necessary).

- 换向阀法兰标准与对接法兰标准一致。 (可查阅随机的技术资料)

The valve's flange is in accordance with the pipe flange. (Random technical information is available).

- 安装空间足够。

Enough installation space.

- 对接管道内已经被清理干净。

Pipes have been cleaned.

- 电磁阀铭牌上标注的电压与电源电压一致。

The voltage marked on the solenoid nameplate is consistent with the supply voltage.

- 对接管道已良好的接地。

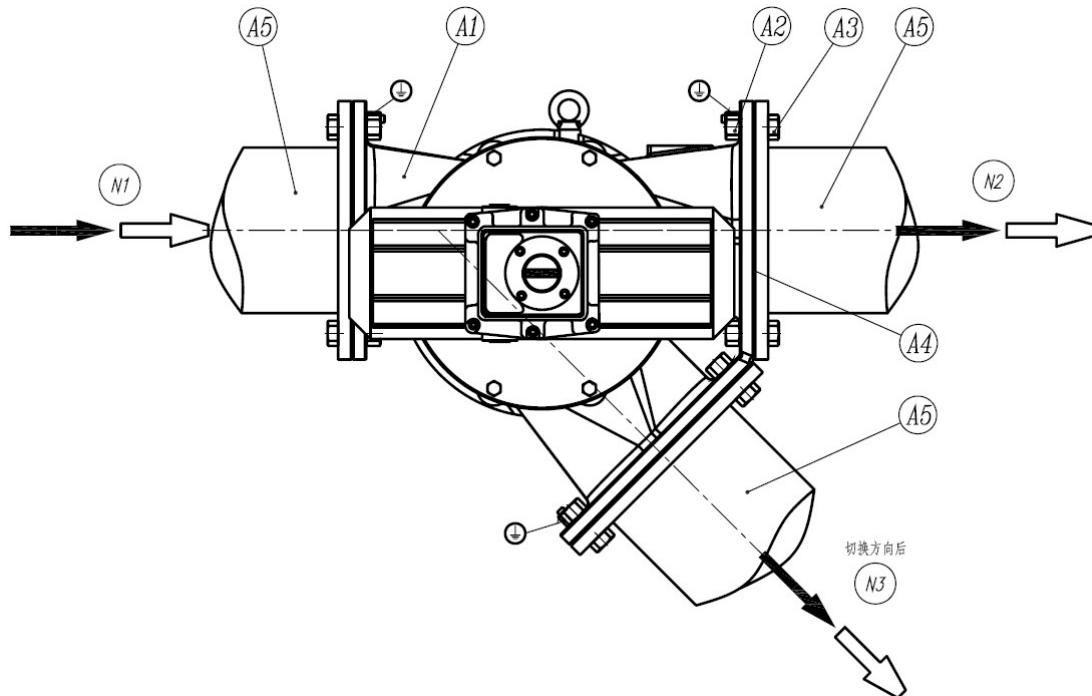
Pipes have been grounded.

- 必须彻底清除对接法兰表面上的防锈剂、污垢或类似污染。

There must be no harmful oil, acid, harmful gas, steam, radioactive environment and so on.

## 6.1.3 典型安装图

## 6.1.3 Typical installation diagram



A-1 典型安装图

A-1 Typical installation diagram

## 符号说明 symbol description

A1	换向阀 Diverter valve	N1	气流与物料混合物入口
A2	螺母 Nut	N2	气流与物料混合物出口 outlet
A3	螺栓 Bolt	N3	气流与物料混合物出口 outlet
A4	密封垫 Sealing gasket	图示阀芯处于直通位置，切换为旁通后 N2 口关闭，N3 口打开。	
A5	管道 Pipe line		
A1	Diverter valve	N1	Air flow and material mixture inlet
A2	Nut	N2	Air flow and material mixture outlet
A3	Bolt	N3	Air flow and material mixture outlet
A4	Sealing gasket	The figure shows that the valve core is in the direct position, closing N2 and N3 after switching to bypass.	
A5	Pipe line		

 静电接地点  
Static Grounding

 物料流向  
Material flow

 气体流向  
gas direction

#### 6.1.4 安装说明

#### 6.1.4 Installation instructions

- N1 口与进料管道连接。N1 is connected to the flowing inlet.
- N2 口与出料管道连接。N2 is connected to the flowing outlet.
- N3 口与出料管道连接。N3 is connected to the flowing outlet.



#### 危险 NOTE

静电不但可能对人体造成伤害，而且也可能引爆危险环境，对设备运转也是不利的，所以需严格按照要求静电接地。

Electroelectricity may not only cause harm to human body, but also may detonate a dangerous environment, which is also adverse to the operation of equipment, so it is necessary to strictly in accordance with the requirements of electrostatic grounding.

#### 6.2 换向阀与管道分离

#### 6.2 The reversing valve is separated from the pipe

- 所需工具同 6.1.1 列出。The required tools are same to 6.1.1.
- 拆除螺栓 A3 和螺母 A2。Remove the bolts A3 and nuts A2.
- 拆除电缆和其他管线。Remove the cables and other pipe lines.
- 起吊⑩吊环螺钉，辅助起吊也是必要的。Lifting the lifting ring screws, auxiliary lifting is also necessary



#### 危险 NOTE

换向阀属于较重物品，拆卸时需要辅助支撑，防止挤压、坠空。

The reversing valve is a heavy item, which needs auxiliary support to prevent extrusion and emptying.



## 注意 NOTE

起吊或搬抬设备时,不得将施力点置于连接薄弱部位(如接线盒支架)。When lift the equipment, you must not put the force point to the valve's weakposition, such as Actuator bracket etc.

### 6.3 分解换向阀

#### 6.3 Decompose the diverter valve

- 所需工具同 6.4.1 列出
- The required tools are listed as in 6.4.1
- 分解时请严格按照使用手册步骤。
- Please follow the manual when decomposition.



## 注意 NOTE

科狮公司生产的换向阀交货时已经安装调试至最佳状态,所以不允许用户对新的设备进行拆解,不允许对设备上的紧固件进行重新预紧和松解。

The replacement valve produced by TECLION company has been installed and tested at the best state at the time of delivery, so the user is not allowed to dismantle the new equipment, and it is not allowed to pre-tighten and loosen the fasteners on the equipment .

分解换向阀前应确保气缸已经切断气源。

Ensure that the cylinder has cut off the air source before splitting the reversing valve.

零件的机加工面放到台子上时需垫橡胶垫以防划伤。

The machining surface of the parts is placed on the table to prevent scratches.

##### 6.3.1 标准系列 DK,DT,DV 换向阀的分解 (参照图 5.10.1)

##### 6.3.1 Decomposition of standard series DK, DT, DV reversing valve

(see Figure 5.10.1)

6.3.1.1 按分离步骤将换向阀从系统管道上取下,置于稳定的工作台上。保证其得到良好的支撑。

6.3.1.1 Remove the reversing valve from the system pipe and place it on a stable workbench. Make sure it gets To the good support.

6.3.1.2 松解阀盖紧固件 8 9 10 11

6.3.1.2 Release the bonnet fasteners 8 9 10 11

6.3.1.3 将驱动端阀盖和气缸 44 等驱动部件一同取下。

6.3.1.3 Remove the drive end valve cap together with the drive member such as the cylinder 44.

6.3.1.4 松解紧固件 18 19 20 或 40 41 42 即可将气缸 44 与阀盖分离。

6.3.1.4 Release er 18 19 20 or 40 41 42 00 to separate the cylinder 44 from the bonnet.

6.3.1.5 用顶丝或侧边软棒敲击 (小口径) , 将非驱动端阀盖 2 带着阀芯 3 一同取下。

6.3.1.5 With a wire or side soft bar (small diameter), remove the nondrive end cover 2 with the core 3.

6.3.1.6 将轴用弹性挡圈 17 取下, 即可将阀芯 3 与阀盖 2 分离。

6.3.1.6 Remove the shaft elastic retaining coil 17 to separate the stem 3 from the bonnet 2.



危险 Danger

分解前勿将手伸入阀体腔扳动阀芯, 否则可能引起剪切。

Do not extend your hand into the valve body chamber before decomposition and pull the valve core, otherwise it may cause shear.



提示 NOTE

标准系列非驱动端留有螺纹孔, 也可以用滑锤取出较紧的阀芯。

The standard series of non-drive ends with threaded holes, you can also use a sliding hammer to remove the tight core.

6.3.2 标准系列 DK,DT,DV 换向阀更换密封 (参照图 5.10.1)

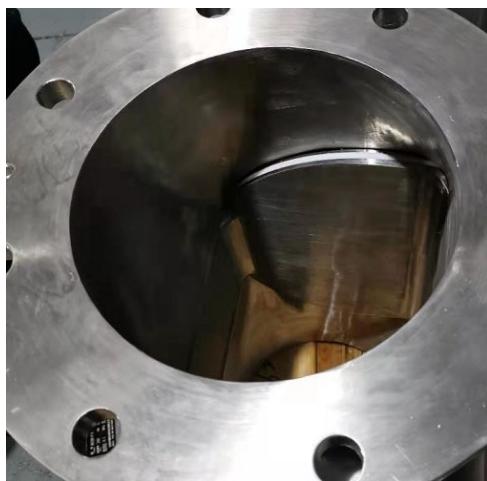
6.3.2 Replacement seals (refer to Figure 5.10.1)

6.3.2.1 将非驱动端阀盖紧固件取下。

6.3.2.1 Remove the non-drive end bonnet fastener.

6.3.2.2 将取下的紧固螺栓充当顶丝旋入顶丝孔将尾端阀盖带着阀芯一起取下。

6.3.2.2 Turn the removed fastening bolt as the top wire into the top wire hole and remove the tail end valve cap together with the valve spool .



6.3.2.3 将更换好密封件的阀芯推入壳体。

6.3.2.3 Push the stem of the replaced seal into the housing.



## 提示 NOTE

当阀芯推入壳体，阀盖与壳体对接面相距 20-25mm 时，气缸驱动方头已经与气缸母孔配合，没有对准时不可利用阀盖紧固件压入防止破坏气缸，正确的操作方法是用较大的活动扳手扳动阀芯使其轻微旋转以对准后再上紧尾端紧固件，对于口径较大的阀，可以将驱动端阀盖带气缸一起取下后再对准安装。

The cylinder is driven when the valve core is pushed into the housing and the valve head is 20-apart from the housing docking surface to 25mm. The square head has cooperated with the cylinder master hole, and the valve cover fasteners should not be used when not aligned. The correct operation is to pull the valve with a larger active wrench to make it lighter Microrotation to align and then tighten the tail end fastener, for a larger caliber valve, can be driven. Remove the moving end valve cap with the cylinders and then align with the installation.

## 6.4 装配换向阀

### 6.4 Assembling

#### 6.4.1 所需工具/辅助材料

#### 6.4.1 Required tools / Auxiliary materials

- 扳手套件 (活动扳手+内六角扳手)
- Wrench kit (active wrench + hexagonal wrench)
- 轴承安装用软质棒 (尼龙或铜棒)
- Soft rod (nylon or copper rod) for bearing installation
- 圆柱冲 (用于取下轴承)
- Column flush (for bearing)
- 橡胶锤或轻锤
- Rubber hammer or light hammer
- 上述工具均非供货范围
- None of the above tools are in the scope of supply

## 6.4.2 安装先决条件

## 6.4.2 Install prerequisites

## 注意 NOTE



不正当安装可能造成换向阀及驱动损伤。

可能造成财产损失

仔细阅读本章节中的说明

Improper installation may cause the reversing valve and drive damage. May cause property damage. Read the instructions in this section carefully

检查下列各点要求是否得到满足：

Check the following requirements:

- 阀芯密封圈完好，轴承等配件规格尺寸吻合。

The spool seal ring is intact, bearing and other accessories specifications and dimensions are consistent.

- 必须彻底清除安装表面的防锈剂、污垢或类似污染。必须使用常用的溶剂。不得让清洗剂进到轴密封环的密封唇上，否则会损坏材料！

Rust, dirt or similar contamination from the mounting surface must be thoroughly removed. Common solvents must be used. Do not allow detergent to the sealing lip of shaft seal ring for material damage!

- 所有零件均是完好无损的。

All the parts are left intact.

- 使用合适的润滑油和润滑脂。

Use a suitable lubricant and greases.

- 周围不得存在有害油污、酸、有害气体、蒸汽、放射性环境等。

There shall be no harmful oil pollution, acid, harmful gas, steam, radioactive environment around.

- 在腐蚀性的环境条件请保护好未有效防腐的零部件。

Protect the parts in corrosive environmental conditions.

## 6.4.3 标准系列 DK, DT, DV 的装配 (参照图 5.10.1)

## 6.4.3 Assembly of standard series

6.4.3.2 将阀芯 3 置于阀体 1 腔中

6.4.3.2 Place the core 3 in the body 1 cavity



## 提示 NOTE

一般建议从阀体非驱动端插入，若配合较紧需要敲击，请尽量避免直接敲击阀芯非驱动端扁头，可以加垫软质垫片后再敲击。

It is generally recommended to insert from the non-drive end of the valve body. If it is tight and needs to knock, please try to avoid directly hitting the flat head of the non-drive end of the valve body. You can add a soft gasket before tapping.



## 注意 NOTE

无论如何，禁止直接敲击驱动端方头。

Regardless, direct tapping of the drive end square head is prohibited.

6.4.3.3 将装好轴承 7, 唇封 14, O 型圈 12 和弹性圈 16 的阀盖 2 缓慢套入阀芯 3 轴上，并轻轻敲入阀体 1 止口配合。

6.4.3.3 Slowly fit the bonnet 2 of bearing 7, lip seal 14, O-ring 12 and elastic ring 16 into the valve shaft 3 shaft and gently tap the valve body 1 stop fit.

6.4.3.4 将装好气缸 44 的驱动端阀盖参照上述步骤也套入阀芯上，并轻轻敲入阀体 1 止口配合。

6.4.3.4 Cover the drive end valve cap of the installed cylinder 44 into the valve core according to the above steps, and gently knock in the valve body 1 stop fit.

6.4.3.5 装好垫圈 6 和轴用弹性挡圈 17。

6.4.3.5 Install washer 6 and shaft with elastic retaining ring 17

6.4.3.6 上好紧固件 8 9 10 11

6.4.3.6 Top good fasteners 8 9 10 11



提示 NOTE

螺柱 10 和螺母 11 要装在气缸下面

The stud 10 and the nut 11 shall be mounted under the cylinder



提示 NOTE

DK,DT,DV 系列换向阀采用了紧凑设计，气缸安装时为了使气缸驱动头与阀芯方扁头能够快速的对中，可以制作芯棒辅助安装。必要时咨询科狮公司。

The DK, DT, DV series reversing valve adopts a compact design. During the cylinder installation, the cylinder drive head and the valve core square flat head can be quickly aligned, and the mandrel can be made to assist the installation. Consult Colion if necessary.

## 7 开车调试 Commissioning

### 7.1 开车准备 Start-up preparation

- 换向阀检修组装完毕或新机，均需试车运行检查，以保证装于系统后能够良好的运转。

After the reversing valve is repaired and assembled or the new machine, the test operation shall be checked to ensure good operation after installation in the system.

- 新机到货开箱后需检查机器完好性，有必要通知科狮公司收货情况。

After the arrival of the new machine to check the integrity of the machine, it is necessary to inform the company of the receiving situation.

- 调试人员需经过专业的培训，且已阅读本手册。

Commissioning personnel shall receive professional training and have read this manual.

- 试车过程中应该严格遵守相关安全规章制度。

Relevant safety rules and regulations should be strictly observed during the commissioning process.

- 原则上换向阀开车时，进出口均需安全遮盖，防止杂物落入。

In principle, when the reversing valve starts, the entrance and exit should be covered safely to prevent debris from falling in.

- 确定电缆电压符合电磁阀铭牌规定。

Determine the cable voltage as per the solenoid nameplate.

- 检查气源压力是否正常。

Check the air source pressure is normal.

- 确认设备已良好的接地。

Inspection of the earthing connections.

## 7.2 试动作

### 7.2 Run Test without Product

确认准备条件无误，即可通入压缩空气，检查阀芯摆动是否到位。

Ensure that the preparation conditions are correct, you can pass into the compressed air, and check whether the valve core movement is in place.

## 7.3 安全须知

### 7.3 Safety instructions



#### 危险 NOTE

试车阶段，不管电磁阀是否通电，禁止将手从任何部位伸入阀芯腔。必须伸入清理异物时，请先拆除电缆。

During the test stage, do not extend the hand from any part, regardless of whether the solenoid valve is energized. When it must be reached in to clear the foreign body, please remove the cable first.



#### 注意 NOTE

开车前务必确保阀芯腔内没有混入杂物（编织袋、布料、螺栓、木头、泥浆等）

Make sure that there are no sundries (woven bags, cloth, bolts, wood, mud, etc.)

## 8 投入运行

### 8 Put into operation

#### 8.1 正常运转

##### 8.1 Normal Operation

正常动作的换向阀有以下指标:

Normal operation of the diverter valve should as follow indicators:

- 动作流畅, 一个动作周期内无超过1次的爬行。

Smooth flowing , No more than 1 crawling time in an action cycle.

- 无异响。

No abnormal sound.

- 无卡死现象。

No blockage.

- 阀芯准确到位。

The valve core is in place accurately.

#### 8.2 关闭设备

##### 8.2 Shut down the device

当遇到以下情况时需要关闭设备: You need to turn off the device if:

- 检修需要。Maintenance needs
- 发生故障。Malfunctioning



#### 注意 NOTE

换向阀停车和切换流向前需确认出料口物料已经被输送完毕, 没有堆积。否则再次启动有可能被卡死。

设备启停需按照用户管理规则。

You should check all the materials under the outlet of the diverter valve have been completely conveyed. Otherwise the rotor may be stucked. Equipment start and stop shall be conducted according to the user management rules.

### 8.3 运行过程中常见问题处理

#### 8.3 Faults, possible Causes and corrective Measures

设备运行过程中出现一些小问题，允许用户根据下表自行处理，必要时请联系科狮公司。未获准许，不得擅自拆解换向阀。

下表中列出的问题解决方法不是唯一的。

常见问题	可能的原因	对应措施
气缸不动作	<ul style="list-style-type: none"> <li>● 电磁阀失灵</li> <li>● 气源压力不够</li> <li>● 电磁阀线圈被锁死</li> <li>● 阀芯被卡死</li> </ul>	<ul style="list-style-type: none"> <li>● 更换电磁阀</li> <li>● 调节过滤减压阀</li> <li>● 调节线圈侧手动锁</li> <li>● 清理阀芯</li> </ul>
开关不到位	<ul style="list-style-type: none"> <li>● 阀芯阻塞，</li> <li>● 气缸力矩不够</li> <li>● 限位装置移位</li> </ul>	<ul style="list-style-type: none"> <li>● 清理阀芯</li> <li>● 调节过滤调压阀</li> <li>● 调节限位装置</li> </ul>
响亮的尖锐声	<ul style="list-style-type: none"> <li>● 金属杂质侵入</li> </ul>	<ul style="list-style-type: none"> <li>● 取出阀芯，将擦痕打磨平整</li> </ul>
物料串通	<ul style="list-style-type: none"> <li>● 阀芯开关不到位</li> <li>● 内密封失效</li> </ul>	<ul style="list-style-type: none"> <li>● 检查开关不到位原因</li> <li>● 更换密封件</li> </ul>
气缸爬行	<ul style="list-style-type: none"> <li>● 阀芯与壳体间介质塑化或异物刮擦</li> <li>● 阀芯与壳体刮擦</li> </ul>	<ul style="list-style-type: none"> <li>● 联系科狮公司</li> </ul>

当按照上述措施仍然不能解决问题时，请及时联系科狮公司客服。

If there are some small problems during the operation of the equipment, users are allowed to deal with them according to the following table. Please contact TECLION company if necessary. The replacement valve shall not be disassembled without permission. The problem solutions listed in the following table are not unique.

Fault	Possible Causes	Corresponding
The cylinders aren't moving	<ul style="list-style-type: none"> <li>● Solenoid valve failure</li> <li>● Gas source pressure is not enough</li> <li>● The solenoid valve coil is locked</li> <li>● The core was stuck</li> </ul>	<ul style="list-style-type: none"> <li>● Replace solenoid valve</li> <li>● Adjust the filter and pressure relief valve</li> <li>● Adjust the coil-side manual lock</li> <li>● Clean the valve core</li> </ul>
The diverter is not diverting or not completing its stroke	<ul style="list-style-type: none"> <li>● Solenoid valve discharge ports dirty or blocked</li> <li>● The cylinder torque is not enough</li> <li>● The limit device is shifted</li> </ul>	<ul style="list-style-type: none"> <li>● Clean the valve core</li> <li>● Adjust the filter and pressure relief valve</li> <li>● Adjust the limit device</li> </ul>
Loud squealing and whistling sound	<ul style="list-style-type: none"> <li>● Metal impurities intrusion</li> </ul>	<ul style="list-style-type: none"> <li>● Remove the spool and polish the wipe marks flat</li> </ul>
There is product leakage on the closed leg	<ul style="list-style-type: none"> <li>● Spool switch is not in place</li> <li>● Internal seal failure</li> </ul>	<ul style="list-style-type: none"> <li>● Check why the switch is not in place</li> <li>● Replace seals</li> </ul>
The pneumatic actuator is losing power	<ul style="list-style-type: none"> <li>● Plasticity or foreign body scraping between valve core and shell</li> <li>● valve core and housing scraping</li> </ul>	<ul style="list-style-type: none"> <li>● contact us</li> </ul>

When the above measures still cannot be solved, please contact the customer service of TECLION company in time.

## 8.4 保养周期

### 8.4 Maintenance period



#### 注意 NOTE

保养前需确保驱动电源已被切断，并且保证设备不会被误启动。

Before maintenance, make sure that the power supply has been cut off and that the equipment is not started by mistake.

保养内容	保养周期	
	每个季度或每运转 2250 小时	每年 或 每运 转 9000 小时
检查外围紧固件是否松动	●	
检查外密封是否泄漏	●	
检查轴承是否正常运转	●	
检查内密封件是否良好	●	
彻底清洗设备		●
检查电磁阀、过滤减压阀工作正常	●	
检查位置信号是否准确	●	
驱动设备	查看气缸使用手册	

Maintenance content	Maintenance Cycle	
	2250 hours per quarter or per operation	9,000 hours of operation per year or per year
Check for loose peripheral fasteners	●	
Check the external seal for leakage	●	
Check the bearings for normal operation	●	
Check that the internal seals are good	●	
Clean the equipment thoroughly	●	
Check that the solenoid valve and filter and pressure relief valve work normally		●
Check that the position signal is accurate	●	
Drive the device	Check the Cylinder use manual	